
Hematopoietic stem cell development in the placenta.

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Public Summary:

This reviews describes recent work by us and others that document the placenta as a major hematopoietic organ.

Scientific Abstract:

The placenta is a highly vascularized organ that mediates fetal-maternal exchange during pregnancy and is thereby vital for the survival and growth of the developing embryo. In addition to having this well-established role in supporting pregnancy, the placenta was recently shown to function as a hematopoietic organ. The placenta is unique among other fetal hematopoietic organs, as it is capable of both generating multipotential hematopoietic cells de novo and establishing a major hematopoietic stem cell (HSC) pool in the conceptus, while protecting HSCs from premature differentiation. The mouse placenta contains two distinct vascular regions that support hematopoiesis: the large vessels in the chorionic plate where HSCs/progenitors are thought to emerge and the labyrinth vasculature where nascent HSCs/progenitors may colonize for expansion and possible functional maturation. Defining how this cytokine- and growth factor rich organ supports HSC generation, maturation and expansion may ultimately help to establish culture protocols for HSC expansion or de novo generation from pluripotent cells.

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